

Remarks/Arguments:

Claims 1, 5, 9 and 10 have been amended. No new matter is introduced herein. Claims 1-10 are pending.

Claims 1 and 5 have been amended to clarify that the first feeding point of the unbalanced antenna is electrically coupled with the ground board and that the second feeding point of the balanced antenna is electrically isolated from the first feeding point. Basis for the amendments to claims 1 and 5 can be found, for example, at page 3, line 25-page 4, line 25; and Fig. 1 of the substitute specification.

Claims 9 and 10 have been objected to. In particular, the phrase "ground plane" in claims 9 and 10 lack antecedent basis. Claims 9 and 10 have been amended to recite "ground board." Accordingly, Applicant respectfully requests that the objection to claims 9 and 10 be withdrawn.

Claims 1-4 and 7-9 have been rejected under 35 U.S.C. §102(b) as being anticipated by Ha et al. (U.S. 2002/0033774). Claims 5, 6 and 10 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Ha et al. It is respectfully submitted, however, that these claims are patentable over the cited art for the reasons set forth below.

Claim 1, as amended, includes features neither disclosed nor suggested by the cited art, namely:

- an unbalanced antenna including
- a first feeding point electrically coupled with the ground board ...
- a balanced antenna including
- a second feeding point electrically isolated from the first feeding point ...
(Emphasis Added)

Claim 5 includes a similar recitation.

Ha et al. disclose, in Fig. 4A, dual band antenna 108 including top loaded monopole type antenna ANT1 and zig-zag type antenna ANT2. Antenna ANT2 and antenna ANT1 are connected to each other by line A. In addition, antennas ANT1 and ANT2 share one feed point B. (Paragraphs [0036-0037]).

Ha et al., however, do not disclose or suggest that a balanced antenna includes a second feeding point that is electrically isolated from the first feeding point (of an unbalanced antenna), where the first feeding point is electrically coupled with the ground board, as required by claim 1 (emphasis added). On page 3 of the Office Action, the Examiner asserts that line A shown in Fig. 4A of Ha et al. is a second feeding point. Applicant respectfully disagrees. Line A of Ha et al. represents an electrical connection between ANT1 and ANT2 (Paragraph [0037]). Furthermore, Ha et al. teach that antennas ANT1 and ANT2 "share one feed point B" (Paragraph [0037]). Thus, Ha et al. cannot teach 1) first and second feeding points and 2) that line A is electrically isolated from feeding point B. Thus, Ha et al. do not include all of the features of claim 1. Accordingly, allowance of claim 1 is respectfully requested.

Claims 2-4 and 7-9 include all of the features of claim 1 from which they depend. Accordingly, these claims are also patentable over the cited art.

With respect to claim 5, the Examiner acknowledges, on page 5 of the Office Action, that Ha et al. fail to teach a load conductor of a balanced antenna including a first portion and a second portion where: a) the impedances of the first and second portions, b) the mutual impedances between the first portion of the load conductor and a second radiator of the balanced antenna, c) the impedance of the second radiator, d) mutual impedances between the third radiator of the balanced antenna and a second portion of the load conductor and e) the impedance of the third radiator satisfy a relationship as recited in claim 5.

In addition, Ha et al. do not teach a balanced antenna including a second feeding point electrically isolated from a first feeding point (of an unbalanced antenna), where the first feeding point is electrically coupled with a ground board, as required by claim 5. As discussed above, Ha et al. teach that ANT1 is electrically connected to ANT2 by line A and that ANT1 and ANT2 share one feeding point (paragraphs [0036-0037]). Thus, Ha et al. cannot teach first and second feeding points and that line A is electrically isolated from feeding point B. Thus, Ha et al. do not include all of the features of claim 5. Accordingly, allowance of claim 5 is respectfully requested.

Claims 6 and 10 include of the features of claim 5 from which they depend. Accordingly, claims 6 and 10 are also patentable over the cited art.

Claims 1-4 and 7-9 have been rejected under 35 U.S.C. §103(a) as being unpatenable over Izadian (U.S. 5,300,936) in view of Kuramoto (U.S. 6,788,265). It is respectfully submitted, however, that these claims are patentable over the cited art for the reasons set forth below.

Claim 1, as amended, includes features neither disclosed nor suggested by the cited art, namely:

- an unbalanced antenna including
- a first feeding point electrically coupled with the ground board ...
- a first radiator having a first end and a second end, the first end of the first radiator being connected with the first feeding point ...
- a load conductor connected with the second end of the first radiator ...
(Emphasis Added)

Izadian discloses, in Fig. 8, an antenna assembly 20C including: i) rod radiator 22 located along a central axis of antenna 20C and ii) planar radiator 24B comprising two orthogonally positioned pairs of dipole radiators 112 (Col. 6, line 62-Col. 7, line 4). Antenna assembly 20C also includes a metallic, electrically conducting plate 28 which serves as a ground plane of the antenna assembly (Col. 3, lines 49-55). Izadian also teaches that rod radiator 22 is electrically connected to the ground plane of plate 28 via box 30 and connector 96 (Col. 5, lines 62-68 and Fig. 2).

As acknowledged by the Examiner on page 7 of the Office Action, Izadian does not teach an unbalanced antenna having a load conductor connected with a second end of a first radiator, as recited in claim 1. Thus, Izadian does not include all of the features of claim 1.

Kuramoto discloses, in Fig. 1, an antenna including printed board 903 and monopole 902 that is joined with a center of circular plate 901 (Col. 1, lines 31-35). Printed board 903 includes a conductive ground board 904 and a dielectric board 905 (Col. 1, lines 36-38). The lower end of monopole 902 extends through a pattern clearance hole 907 "without touching the ground board 904" and is joined with microstrip line 906 (under dielectric board 905) at a power supply point 908 (Col. 1, lines 40-45).

Kuramoto, however, does not disclose or suggest that an unbalanced antenna includes a first feeding point electrically coupled with the ground board, as required by claim 1 (emphasis

added). Instead, Kuramoto teaches that the feeding point is electrically isolated from the ground board. Thus, Kuramoto cannot teach that a feeding point is electrically coupled with a ground board. In addition, Izadian teaches that rod radiator 22 is electrically connected to the ground plane (Col. 5, lines 62-68). In contrast, Kuramoto teaches that monopole 902 is electrically isolated from ground board 904. Because Kuramoto teaches away from electrically coupling the feeding point to the ground board, the skilled person would not combine the antenna of Kuramoto with the antenna of Izadian to produce the subject invention. Thus, Kuramoto does not include all of the features of claim 1. Accordingly, allowance of claim 1 is respectfully requested.

Claims 2-4 and 7-9 include all of the features of claim 1 from which they depend. Accordingly, these claims are also patentable over the cited art.

In view of the amendments and arguments set forth above, the above-identified application is in condition for allowance, which action is respectfully requested.

Respectfully submitted,

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Dated: December 16, 2008

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